
New Species in the Acanthaceae of Costa Rica

Jorge Gómez-Laurito

Escuela de Biología, Universidad de Costa Rica, Ciudad Universitaria,
2060 San José, Costa Rica

Barry E. Hammel

Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A.

ABSTRACT. As a result of the current general inventory of the flora of Costa Rica, six new species of Acanthaceae are described. Three, *Justicia aurantiimutata*, *J. deaurata*, and *J. peninsularis*, are known only from the Osa Peninsula, or nearby. The other three, *Habracanthus tilaranensis*, *Kalbreyeriella rioquebradasiana*, and *Razisea villosa*, are more widespread but still known only from Costa Rica.

Collections from relatively well known regions of the tropics, even of easily collected habit types, continue to reveal novelties. In spite of the recency of floristic treatments for the Acanthaceae of Costa Rica and Panama (Durkee, 1978, 1986), numerous additions have since come to light for the region (cf. Daniel, 1993; Daniel & Wasshausen, 1990; Gómez-Laurito, 1990; Gómez-Laurito & Grayum, 1991). Three of the six Costa Rican species described below are red-flowered, road or trailside subshrubs of well-traveled areas. The other three are from the long-isolated and little-explored Osa Peninsula and have lavender, yellow, or green flowers.

Habracanthus tilaranensis Gómez-Laurito, sp. nov. TYPE: Costa Rica. Puntarenas: Esparza, Peñas Blancas Refugio de Vida Silvestre, 10°07'50"N, 84°40'25"W, 1,000–1,400 m, 30 Nov. 1986 (fl, fr), *G. Herrera et al.* 292 (holotype, CR; isotype, MO). Figure 1.

Species combinatione foliorum lanceolatorum, inflorescentiarum paniculatarum, 25 cm × 8 cm, corollarum bilabiatarum, flavarum apice rubro, fructuum pilosorum a congeribus distinguenda.

Suffruticose shrubs 1–4 m tall, internodes 2–2.5 cm long, sparsely pubescent. Petioles 3–8 cm long, glabrous. Lamina lanceolate, 13–17 cm long, 5–7.3 cm wide, acuminate at the tip, long attenuate at base, glabrous on both surfaces with ca. 10 pairs of arcuate secondary nerves, margin entire. Inflorescence paniculate, terminal, many-flowered, ca. 25 cm long and 8 cm wide. Peduncles of the panicle

about 10 cm long, quadrangular, short pilose. Branches to 3 cm long, flattened, short puberulous with intermixed glandular and non-glandular trichomes. Secondary branches to 1 cm long. Tertiary branches to 5 mm long. Pedicels 2–3.5 mm long, hirsute with intermixed glandular and non-glandular trichomes. Bracts 1.5–2.5 cm long, ovate, short acuminate at tip, almost sessile. Bracteoles minute, subulate, ca. 1 mm long. Calyx 5-merous, segments lanceolate, 3–5.5 mm long, short puberulous with scattered glandular trichomes, undivided portion 0.5 mm long, swollen. Corolla bilabiate, arched in bud, straight in anthesis, 11 mm long, 2.5 mm wide, yellow with red tip, sparsely pubescent (eglandular), expanded just above the tube; tube 4 mm long, 1.3 mm wide; throat 2.5 mm diam.; upper lip 1.5 mm long, straight, acute; lower lip 3-lobulate, lobules ca. 1 mm long, acute. Stamens 2, exerted to 6 mm longer than the corolla; filaments flattened, glabrous; anthers dorsifixed, longitudinally dehiscent, locule 2 mm long; pollen spheroidal, ca. 40 μm diam. (Fig. 7A). Ovary glabrous, attached on a basal disc; disc 0.8 mm long, 0.6 mm wide, glabrous. Style exerted to 6 mm longer than the corolla, glabrous; stigma simple, capitate. Fruits claviform, 1 cm long, pilose (eglandular), acute at the tip; retinacula acute. Seeds elliptic, 2 mm long, 1.2 mm wide, truncate at the base, pale yellow, papillose throughout.

Habitat and distribution. Known only from moist forest at mid elevations on the Pacific slope of the Cordillera de Tilarán.

Paratypes. COSTA RICA. **Guanacaste:** Abangares, El Dos, 10°22'N, 84°54'W, 900 m, 19 Oct. 1986 (fl), *Haber & Bello* 5996 (CR, MO).

Justicia aurantiimutata Hammel & Gómez-Laurito, sp. nov. TYPE: Costa Rica. Puntarenas: Reserva Forestal Golfo Dulce, Cantón de Osa, camino nuevo entre Rancho Quemado y Drake, 08°43'N, 83°36'W, 100–350 m, 7 Feb. 1991 (fl, fr), *Hammel et al.* 18074 (holotype, CR; isotypes, ARIZ, CAS, INB, MO). Figure 2.



Figure 1. *Habracanthus tilaranensis* Gómez-Laurito (Herrera et al. 292).

Ab affini *J. readii* Panamae pariter versicolori in siccitate (sed illa rubescens) differt statura minore, inflorescentiis longioribus et laxioribus, bracteis et floribus minoribus. Tincto aurantio prodit a speciebus nobis notis distincta.

Herbs to 40 cm tall; stems terete; internodes 4–5 cm long. Stems, internodes, nodes, petioles, and young parts hirsute, the trichomes turning orange to rusty brown upon drying. Petioles 10–15 mm long, hirsute. Lamina elliptic, 4–11 cm long, 2–3.5 cm wide, pilose to hirsute on both surfaces, with ca. 10 pairs of secondary veins, acute at the tip, basally cuneate, margin entire, undulate, ciliate. Inflorescences spicate, 5–11 cm long, axillary and terminal, many-flowered, dense, becoming lax in fruit; flowers alternate. Peduncle 2–4 cm long, 0.1 mm wide, terete, glandular-pilose. Rachis flattened, ca. 1 mm wide, pubescent with eglandular and glandular trichomes. Bracts obovate, 4.5–7.5 mm long, 3.5–4.5 mm wide, acute to rounded at apex, basally cuneate, hirsute with intermixed gland-tipped and non-glandular trichomes. Bracteoles lanceolate, 3–4 mm long, acute at the tip, otherwise similar to bracts. Calyx 5-merous, segments of equal length, subulate, pilose with intermixed glandular and non-glandular trichomes. Corolla bilabiate, 10–13 mm long, white to lavender with purple lines, glabrous; tube 4 mm long, 2 mm wide; throat 2 mm diam.; upper lip 4 mm long, 1.5 mm wide, straight; lower lip broadened, 6 mm long, 6.5 mm wide. Stamens 2, slightly exerted, but not exceeding the upper lip; filaments flattened, glabrous; anthers two-locular, dorsifixed, longitudinally dehiscent, locules superposed, separated by a connective, lower locule drawn out into a hyaline spur; pollen prolate, ca. $34 \times 24 \mu\text{m}$ (Fig. 7B). Ovary glabrous; style slightly exerted; stigma simple, capitate. Fruits clavate, 1 cm long, short pilose, acute at the tip; retinacula acute. Seeds 4, broad-elliptic, 1.5 mm long, 2 mm wide, basally slightly cordate, rusty, aculeate throughout.

Habitat and distribution. This species is known only from two localities, at the edge of primary forest, on the Osa Peninsula. Recent collections from the type locality have brought to light a number of disjunctions with northern Amazonia such as *Anaxagorea dolichocarpa* Sprague & Sandwith (Annonaceae) and *Ichnanthus panicoides* Beauvois (Poaceae). Because the Osa Peninsula, in general, is unusually rich in apparent disjuncts from South America (e.g., *Pterygota excelsa* (Standley & L. O. Williams) Kostermans (Sterculiaceae), *Williamodendron*, *Caryodaphnopsis* (Lauraceae)), there is reason to suspect that the nearest relatives of this new species may lie to the south rather than with

its Mesoamerican congeners from which it differs markedly.

Etymology and relationships. The epithet refers to the remarkable change this species, especially its pubescence, undergoes from more or less colorless to bright orange or rusty-colored upon drying. It must be noted, however, that this change appears in conjunction with material conserved in alcohol in the field and later dried. Freshly dried material retains its subdued hues but shows its colors in water, which it darkly and rapidly tints orange—rather than blue as in the manner of *J. tinctoria* (Oersted) D. N. Gibson.

Among the Costa Rican species *J. aurantiimutata* is most similar to *J. refractifolia* (Kuntze) Leonard, which differs most obviously by its pubescent filaments and lack of glandular trichomes. However, *J. readii* T. F. Daniel & Wasshausen from Panama matches *J. aurantiimutata* in those (and other) characters. From that species it differs in smaller stature, longer, more lax inflorescences, smaller bracts, and smaller flowers. Furthermore, the color change in *J. readii* is to red, involves only the bracts, and apparently happens irrespective of how the plants were treated before drying. The pollen also differs markedly from that of *J. readii*; it is quadrilaterally instead of trilaterally symmetric and the two rows in the trema region are not divided into insulae. Neither *J. refractifolia* nor *J. readii* appears to produce an orange dye. In life, *J. aurantiimutata* is a rare and rather small, nondescript, forest herb with pale lavender flowers.

Paratypes. COSTA RICA. **Puntarenas:** Reserva Forestal Golfo Dulce, Cantón de Osa, camino nuevo entre Rancho Quemado y Drake, 08°43'N, 83°36'W, 100–350 m, 11 Apr. 1992 (fr), Hammel et al. 18485 (F, INB, MO, US), 7 Feb. 1991 (fr), Maas et al. 7879 (CR, U); Alto los Mogos, 08°45'N, 83°22'20"W, 20 m, 9 Jan. 1991 (fl), E. Castro 19 (CR, MO, USJ); Parque Nacional Corcovado, Cerro Brujo, orilla de la Quebrada Vaquedano, 8°38'N, 83°35'W, 400 m, 22 Jan. 1991 (fl), Cordero 140 (CR).

Justicia deaurata Hammel & Gómez-Laurito, sp. nov. TYPE: Costa Rica. Puntarenas: Reserva Forestal Golfo Dulce, Cantón de Osa, Fila al N del antiguo campo de aterrizaje, Estación Agua Buena de Boscosa, 8°42'40"N, 83°31'W, 50–150 m, 7 Nov. 1991 (fl), Aguilar & Hammel 609 (holotype, CR; isotypes, ARIZ, CAS, INB, MO, US). Figure 3.

A *J. aurea* inflorescentiis ferrugineo-tomentosis, 1–3 spicatis, bracteis bracteolisque minoribus, calycis lobis latioribus, corollis majoribus recedit.

Shrubs to 2.5 m tall; branches quadrangular, conspicuously ferruginous-tomentose on younger



Figure 2. *Justicia aurantiimutata* Hammel & Gómez-Laurito (*Hammel et al.* 18074). —A. Habit. —B. Corolla. —C. Anther. —D. Bract. —E. Bracteoles, calyx, and capsule.

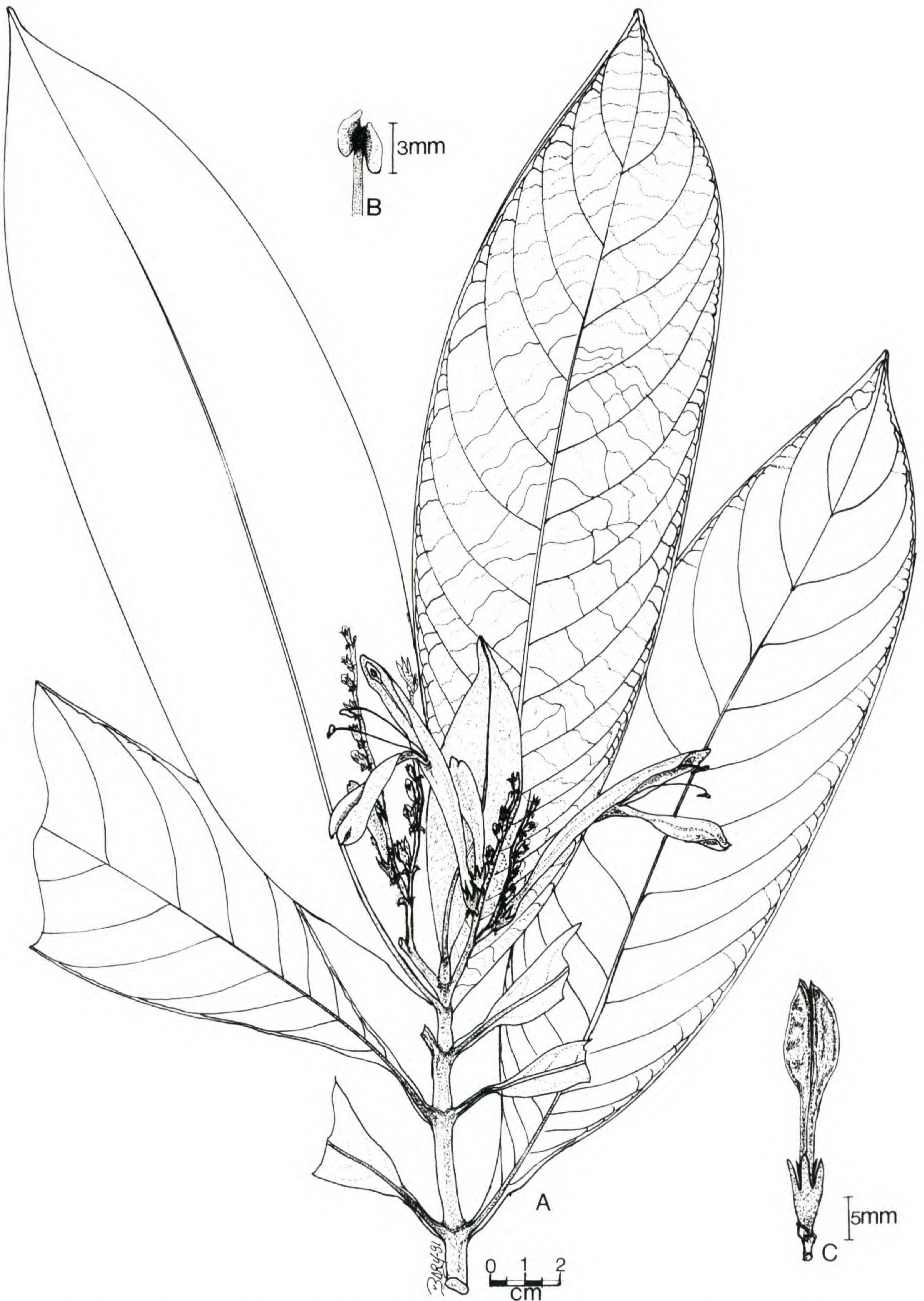


Figure 3. *Justicia deaurata* Hammel & Gómez-Laurito (Aguilar & Hammel 609). — A. Habit. — B. Anther. — C. Capsule subtended by minute bracteoles and bracts.

branchlets; internodes 1.5 cm long. Petioles 0.5–1 cm long, ferrugineous-tomentose. Lamina elliptic, 23–34 cm long, 4.5–9 cm wide, with ca. 11–15 pairs of secondary veins, acuminate at the tip, basally cuneate, margin entire, undulate, the midrib basally ferrugineous, tomentose beneath. Inflorescences grouped at branch tips, the axes with 1–3 spikes of secund flowers on a common peduncle ca. 1 cm long. Each rachis ca. 2–7 cm long, 2 mm wide, quadrangular, ferrugineous-tomentose. Bracts minute, 1–1.5 mm long, subulate, basally ferrugineous-tomentose. Bracteoles bractlike. Calyx 5-merous, 8–10 mm long, segments of equal length, subulate, 4.5–5 mm long, tomentose inside, undivided portion 4–5 mm long, 1.5–2 mm wide at base. Corolla bilabiate, 5.5–7 cm long, bright golden yellow, sparsely pubescent externally with minute gland-tipped trichomes; tube 3.5–4.5 cm long; throat 5 mm diam.; upper lip straight, 2.5 cm long; lower lip broadened, 2.5 cm long, 3-lobulate, lobules ca. 4.5 mm long. Stamens 2, slightly exerted, but not exceeding the upper lip; anthers with unequal cells, bigger cell 3 mm long, smaller cell 2 mm long; pollen prolate, ca. $73 \times 37 \mu\text{m}$ (Fig. 7C). Ovary pubescent, attached into a basal disc; style slender; stigma simple capitate. Fruits claviform, glabrous, 30 mm long, 8 mm wide, acute; retinacula acute. Seeds orbicular, flat, papillose, yellow.

Habitat and distribution. This species is known only from a single population in tall, primary, hillside forest near Rincón de Osa. The area is also home to the endemic Rubiaceae *Osa pulchra* (D. R. Simpson) Aiello, as well as one of two sites on the peninsula with *Recchia simplicifolia* T. Wendt & E. J. Lott, an unusual species of Simaroubaceae disjunct (from southern Mexico).

Etymology and relationships. The epithet is derived from the combination of the prefix “de,” which in many Latin words imparts an emphatic or repetitive nuance as in “declare—to make clear” or “decantare—to sing or say repeatedly,” with “auratus—golden,” in reference to the very bright, golden yellow corollas of this species. *Justicia deaurata* differs from the other large, yellow-flowered Costa Rican *Justicia* (*J. aurea* Schlechtendal) by its smaller, spicate-secund inflorescences, much smaller bracts and bracteoles, shorter and broader calyx lobes, somewhat larger corollas, ferrugineous pubescence, shinier, darker green leaves, and primary rather than secondary forest habitat. In view of its spicate-secund inflorescences, *J. deaurata* would key to the vicinity of *J. spicigera* Schlechter and *J. tinctoria* in Durkee (1986). It differs markedly from both of those species by its much larger, bright

yellow flowers, anthers with unequal cells, its ferrugineous pubescence, and in that it does not produce a blue dye. More than any of the other *Justicia* species described here *J. deaurata* seems to lack close relatives among its southern Central American congeners. It can be recognized by its large yellow flowers and the brownish tomentose inflorescence rachis. The species would make a handsome ornamental but does not fare well in open, garden habitat.

Paratypes. COSTA RICA. **Puntarenas:** Reserva Forestal Golfo Dulce, Cantón de Osa, Fila al N del antiguo campo de aterrizaje, Estación Agua Buena de Boscosa, 08°42'40"N, 83°31'W, 100–500 m, 28 nov. 1990 (fl), Hammel 17981 (CR, MO), 22 nov. 1991 (fl, fr), Aguilar 690 (CR, F, INB, MO).

Justicia peninsularis Gómez-Laurito & Hammel, sp. nov. TYPE: Costa Rica. Puntarenas: Cantón de Osa, Aguabuena de Rincón, 8°42'40"N, 83°31'40"W, 400 m, 25 Oct. 1990 (fl, fr), G. Herrera 4505 (holotype, CR; isotypes, ARIZ, INB, MO, US). Figure 4.

Ab affini *J. orosiensis* differt bracteis et floribus multo majoribus; statura, foliis et inflorescentiis grandibus ab aliis speciebus regionis distincta.

Suffruticose herbs to 1.5 m tall. Stems quadrangular. Internodes 9.5–10 cm long, 3.5–4 mm wide, pale green. Petioles 3–6.5 cm long, \pm quadrangular, sparsely pilose, canaliculate above. Lamina broadly elliptic, 10–33 cm long, 10–13.5 cm wide, with ca. 10 pairs of secondary veins, the other veins conspicuously reticulate, acuminate at the tip, basally truncate, margins entire. Inflorescence thyriform, terminal, many-flowered, 13–20 cm long, 3 cm wide, branches opposite but flowers alternate. Pedicels 12–20 mm long, quadrangular, pilose. Bracts 1–1.6 cm long, 0.5–0.8 cm wide, acute at apex, ciliate at margins, conspicuously veined and punctate. Bracteoles 1–1.5 cm long, 1–1.3 mm wide, punctate, margins ciliate, conspicuously veined. Calyx 5-merous, segments of equal length, subulate, 7.5 mm long, punctate, margins and midrib ciliate. Corolla bilabiate, 2.8 cm long, green, externally pilose; tube 1.9 cm long, white; throat 5 mm diam.; upper lip straight, 8 mm long, minutely bidentate; lower lip 7 mm long, downward curved, pale green with longitudinal reddish purple lines, 3-lobulate, lobules 1.5–2 mm long. Stamens 2, slightly exerted but not exceeding the upper lip; filaments slender; anthers with superposed locules; locules 2.5 mm long, longitudinally dehiscent; pollen prolate, ca. $47 \times 26 \mu\text{m}$ (Fig. 7D). Ovary glabrous; style slender; stigma single, capitate. Fruits claviform, 9–10 mm long, glabrous, cuspidate at the tip; retinacula acute

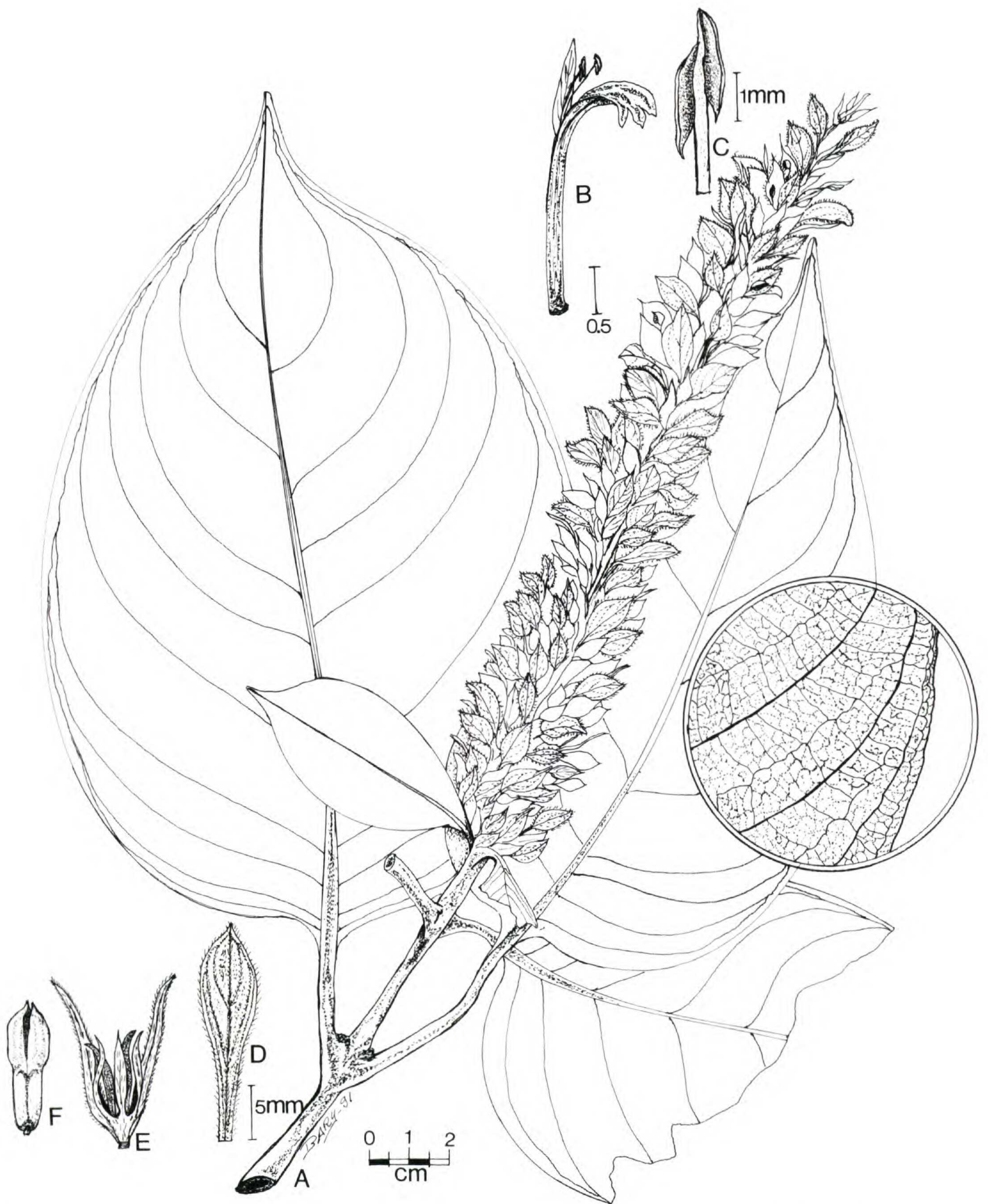


Figure 4. *Justicia peninsularis* Gómez-Laurito & Hammel (*Hammel et al.* 18019). — A. Habit. — B. Corolla. — C. Anther. — D. Bract. — E. Bracteoles and calyx. — F. Capsule.

or rounded. Seeds 2, \pm orbicular, ca. 2 mm diam., bright brown to black.

Habitat and distribution. This species is found throughout the wettest parts of the Osa Peninsula where it is locally common, especially at the edge of primary forest on slopes.

Etymology and relationships. *Justicia peninsularis* derives its epithet from having been first encountered on the Osa Peninsula. This species appears to be closely related to *J. orosiensis* Durkee, from which it differs mainly by its much larger flowers and bracts but also by its generally large stature, leaves, and inflorescence, distinguishing it,

as well, among other *Justicia* spp. of the region. Another apparently undescribed species of the wet Caribbean lowlands (e.g., *Grayum et al.* 7937, *Robles* 1524, and *Stevens et al.* 24932) bears considerable resemblance to *J. peninsularis* but differs, among other details, in having pubescent, somewhat smaller leaves that are basally cuneate, pubescent pedicels, and white rather than green corollas.

Paratypes. COSTA RICA. **Puntarenas:** Refugio Nacional de Vida Silvestre Golfito, 8°40'30"N, 83°12'W, 160–240 m, 11 Dec. 1988 (fl), *Grayum & Herrera* 9203 (CR); Cantón de Osa, Aguabuena, Fila Casa Loma, siguiendo el antiguo camino a Rancho Quemado, 8°43'N, 83°32'W, 500 m, 2 Oct. 1990 (fl), *G. Herrera* 4431 (CR, INB); Cantón de Osa, Fila Ganado al noroeste de Rancho Quemado, 8°44'N, 83°36'50"W, 350 m, 15 Dec. 1990 (fl, fr), *Hammel et al.* 18019 (ARIZ, CR, F, MO, US); Cantón de Osa, entre Rancho Quemado y Drake, 8°43'N, 83°36'W, 300 m, 7 Feb. 1991 (fl, fr), *Hammel et al.* 18080 (CR, INB, MO); Parque Nacional Corcovado, 08°38'N, 83°35'W, 600 m, 23 Jan. 1991 (fl), *E. Castro* 232 (CR, MO).

Kalbreyeriella rioquebradasiana Gómez-Laurito & Hammel, sp. nov. TYPE: Costa Rica. San José: Cantón de Pérez Zeledón, Cerro de la Muerte, carretera interamericana km 115–116, 09°28'40"N, 83°41'25"W, 1,750 m, 4 Feb. 1991 (fl, fr), *Hammel et al.* 18053 (holotype, CR; isotypes, ARIZ, CAS, F, INB, MO, US, USJ). Figure 5.

Ab affini *K. rostellata* differt foliis et floribus multo minoribus.

Subshrubs to 60 cm tall. Stems and branchlets slender, with appressed trichomes. Petioles 8–11 mm long, terete, appressed-pilose canaliculate above. Lamina elliptic, 7–12 cm long, with ca. 11 pairs of secondary veins, acuminate at apex, basally attenuate, secondary veins minutely appressed-pilose beneath, margins entire, undulate. Inflorescence racemose, slender, axillary and terminal, many-flowered, 6–12 cm long, 1.5–2 cm wide; rachis with minute appressed trichomes. Bracts ovate, 2.5 mm long, glabrous, acute at the tip. Bracteoles 1.5 mm long, subulate, glabrous. Pedicels 1–4(–6) mm long. Calyx 5-merous, segments of equal length, lanceolate, 4–4.5 mm long, green, glabrous. Corolla bilabiate, ventricose in bud, arched and abruptly inflated above the calyx in anthesis, red with yellow tip, 2.8–3 cm long; throat 3.5 mm diam.; upper lip 3 mm long, straight, minutely bidentate at the tip; lower lip minute, 3-lobulate. Stamens 2, exerted to 2 cm longer than the corolla; filaments flattened, reddish; anthers 1-locular, 2 mm long, basifixed, longitudinally dehiscent; pollen spheroidal, ca. 58 μ m diam. (Fig. 7E). Ovary glabrous; style exerted to 2 cm

longer than the corolla, reddish; stigma single, capitate. Fruits claviform, 12–13 mm long, glabrous, acute at the tip. Seeds elliptic, 3 mm long, 2 mm wide, dark brown.

Habitat and distribution. In wet forest at middle elevations (ca. 1,700 m) on the southern slope of Cerro de la Muerte, known only from along the Interamerican Highway just north of San Isidro del General. The species is common here but apparently restricted to a relatively narrow zone.

Etymology and relationships. The epithet refers to the Río Quebradas stream, which passes by the type locality. This species is unusual among Costa Rican Acanthaceae for having bright red, yellow-tipped corollas in a racemose inflorescence. It differs from the Panamanian and Colombian *K. rostellata* Lindau primarily by virtue of its much smaller leaves and flowers. In spite of the stated differences (Durkee, 1978) between *Kalbreyeriella* and *Razisea* (in *Kalbreyeriella* the corolla is beaked and gibbous in bud, and the bracts are 2–3 times shorter than the calyx lobes), individuals of the common *R. spicata* Oersted often have beaked and somewhat gibbous corollas and bracts that vary from shorter to longer than the calyx lobes. Resemblance of pollen of *K. rioquebradasiana* and the species of *Razisea* described below further suggests that a critical study of the supposed differences between these two genera is in order (see McDade, 1982). Unfortunately, the problem involves at least one or two other genera (McDade, pers. comm.) and will not be resolved here. Given that the bracts are about half the length of the calyx lobes in both species, the rationale for describing the present one in *Kalbreyeriella* and the following in *Razisea* is that this species has a much more abruptly inflated corolla.

Paratypes. COSTA RICA. **San José:** Cantón de Pérez Zeledón, Cerro de la Muerte, Carretera Interamericana Km 117, 09°28'40"N, 83°41'25"W, 1,700 m, 8 Nov. 1990 (fl), *Hammel & M. M. Chavarría* 17957 (CR, MO), 27 Nov. 1990 (fl), *Hammel* 17975 (CR, MO).

Razisea villosa Gómez-Laurito & Hammel, sp. nov. TYPE: Costa Rica. Puntarenas: Golfito, Jiménez, Dos Brazos de Río Tigre, margen izquierda de Quebrada Brasileña, Fila Puriscal Rico, subiendo a Cerro Müller, 8°30'55"N, 83°28'15"W, 700 m, 24 Nov. 1990 (fl, fr), *G. Herrera & C. Fallas* 4641 (holotype, CR; isotypes, ARIZ, CAS, F, MO, US). Figure 6.

Species statura minori, caulibus conspicue villosis, floribus minoribus a congeribus distinguenda.

Herb 25–70 cm tall. Stems quadrangular, villose with curled, multicellular 1–2-mm-long trichomes.



Figure 5. *Kalbreyeriella rioquebradasiana* Gómez-Laurito & Hammel (Hammel 17957). —A. Habit. —B. Flower. —C. Bract, bracteoles, and calyx.

Internodes 3–7 cm long. Petioles 1–3 mm long, villose. Lamina elliptic, 15–20 cm long, 5–8.5 cm wide with ca. 11 pairs of secondary veins, acuminate at the tip, basally attenuate, margins undulate, villose on both surfaces. Inflorescence racemose, terminal, 11–24 cm long, ca. 3 mm wide, many-flow-

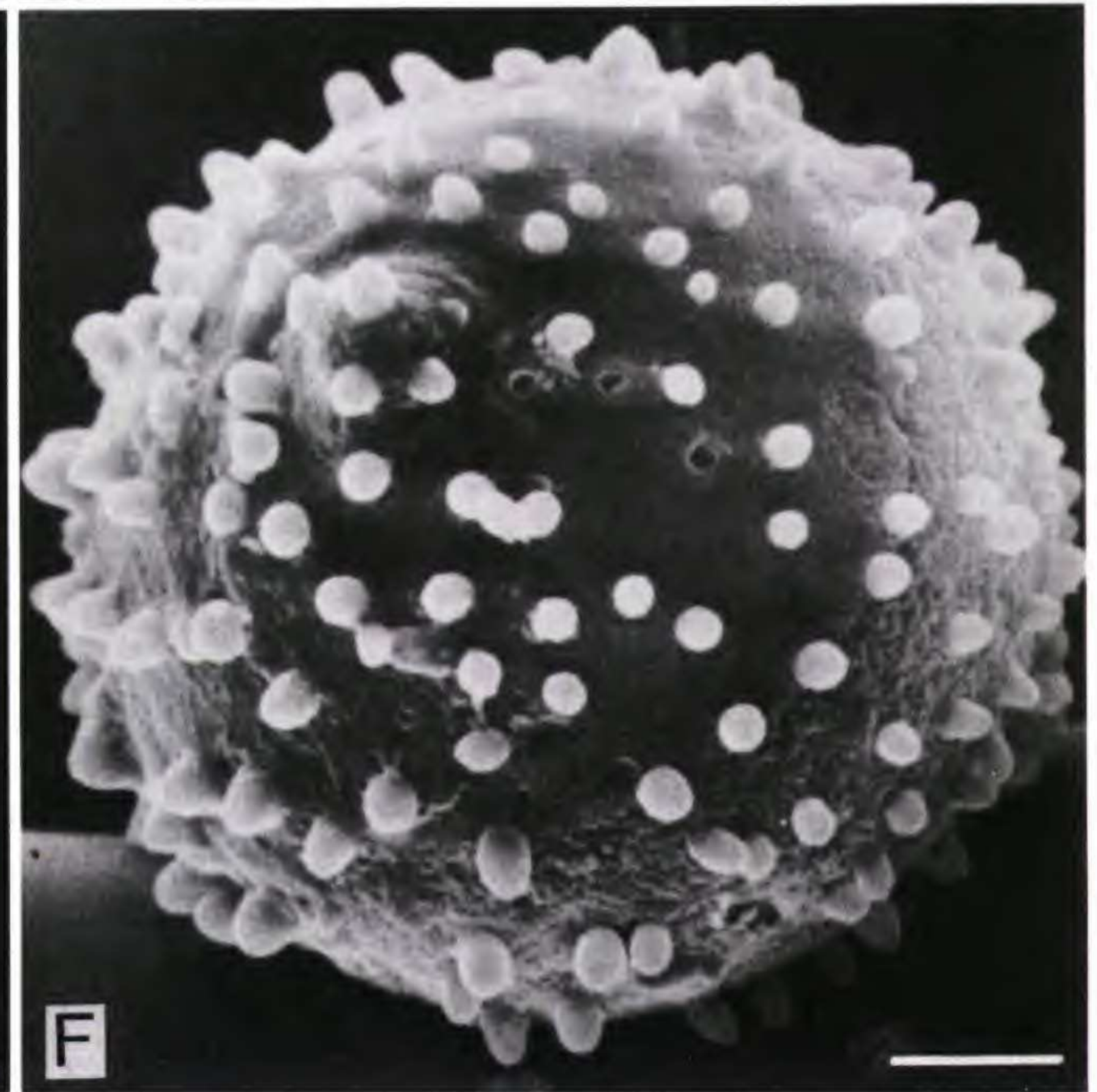
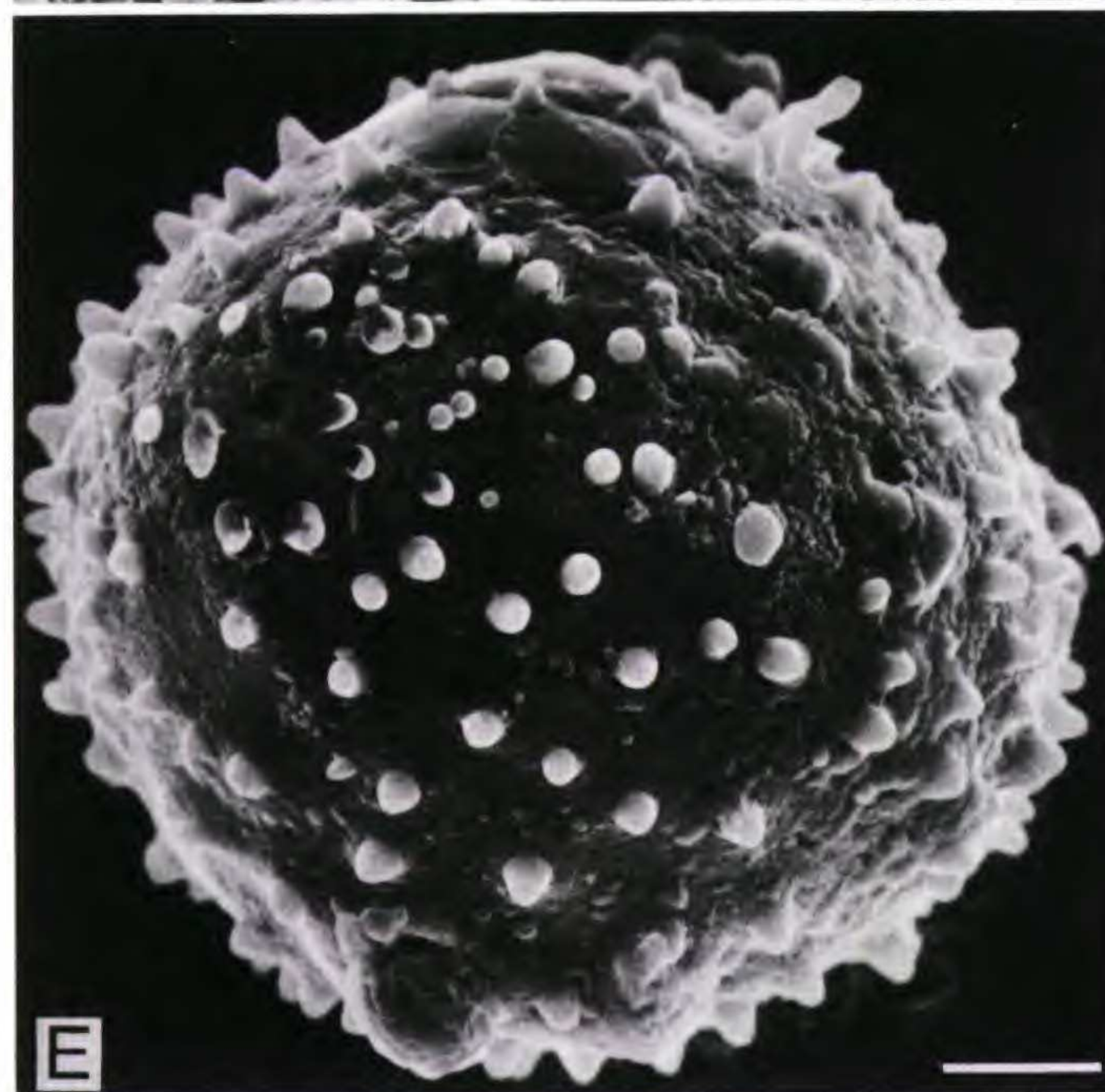
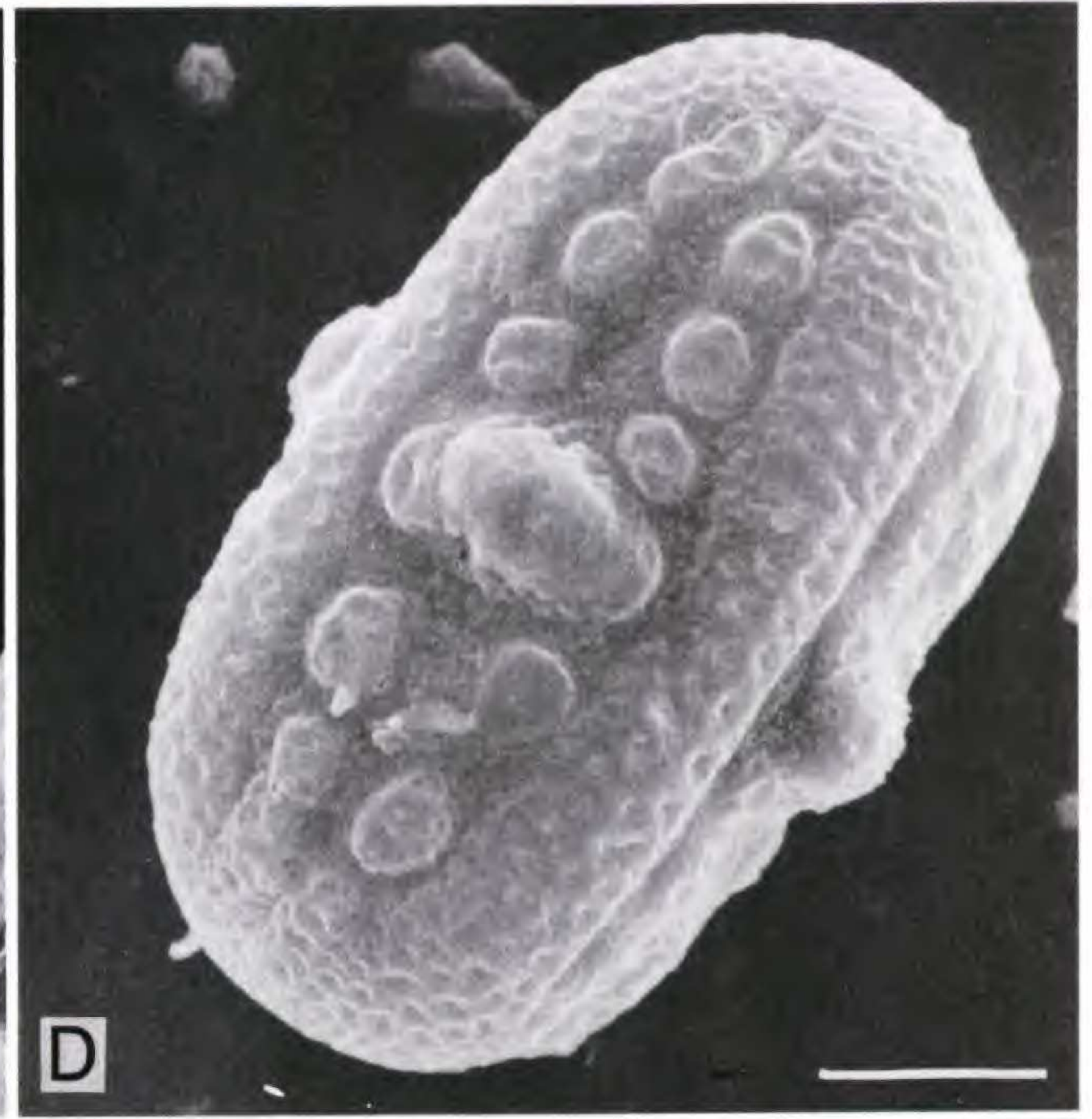
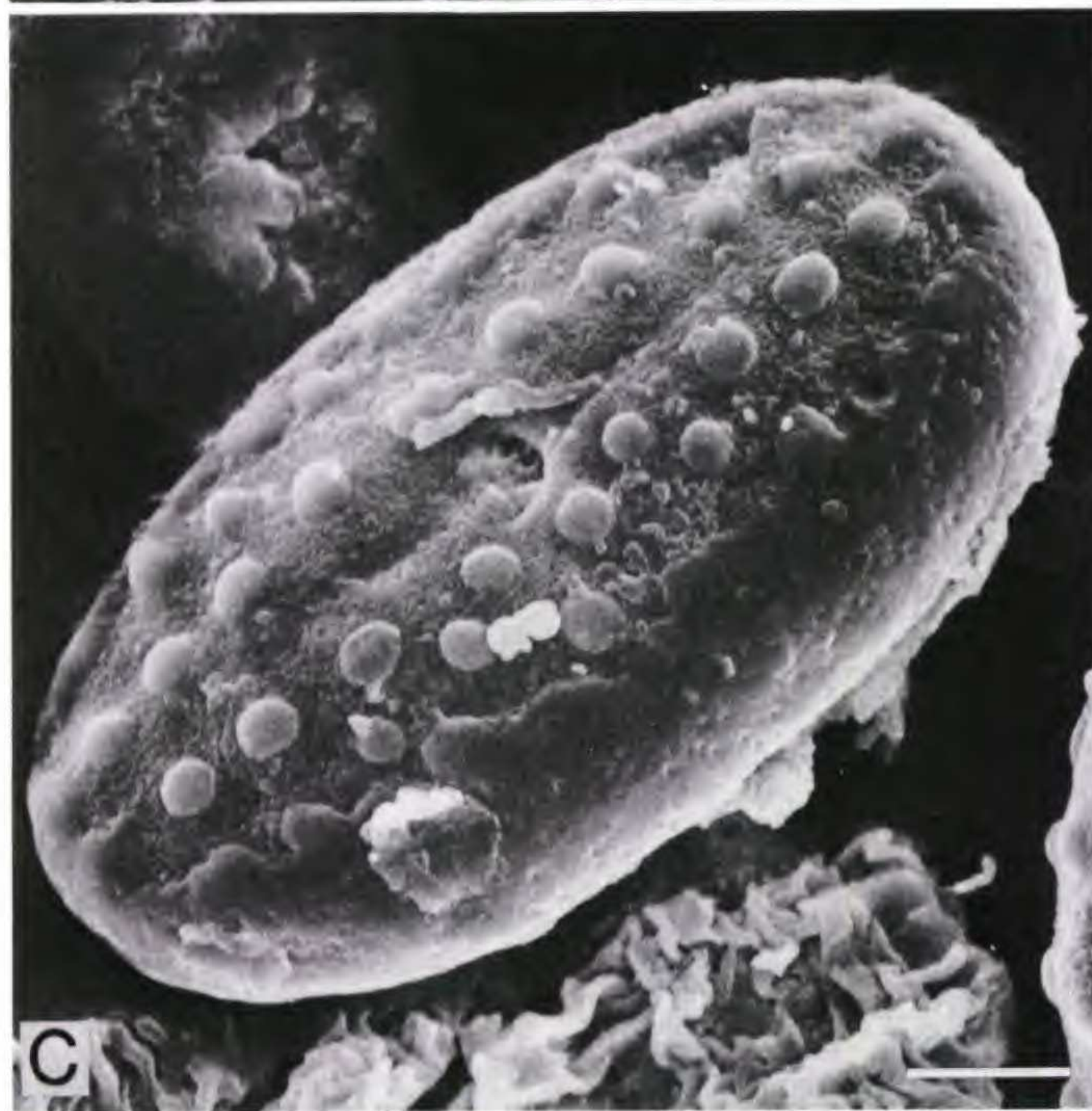
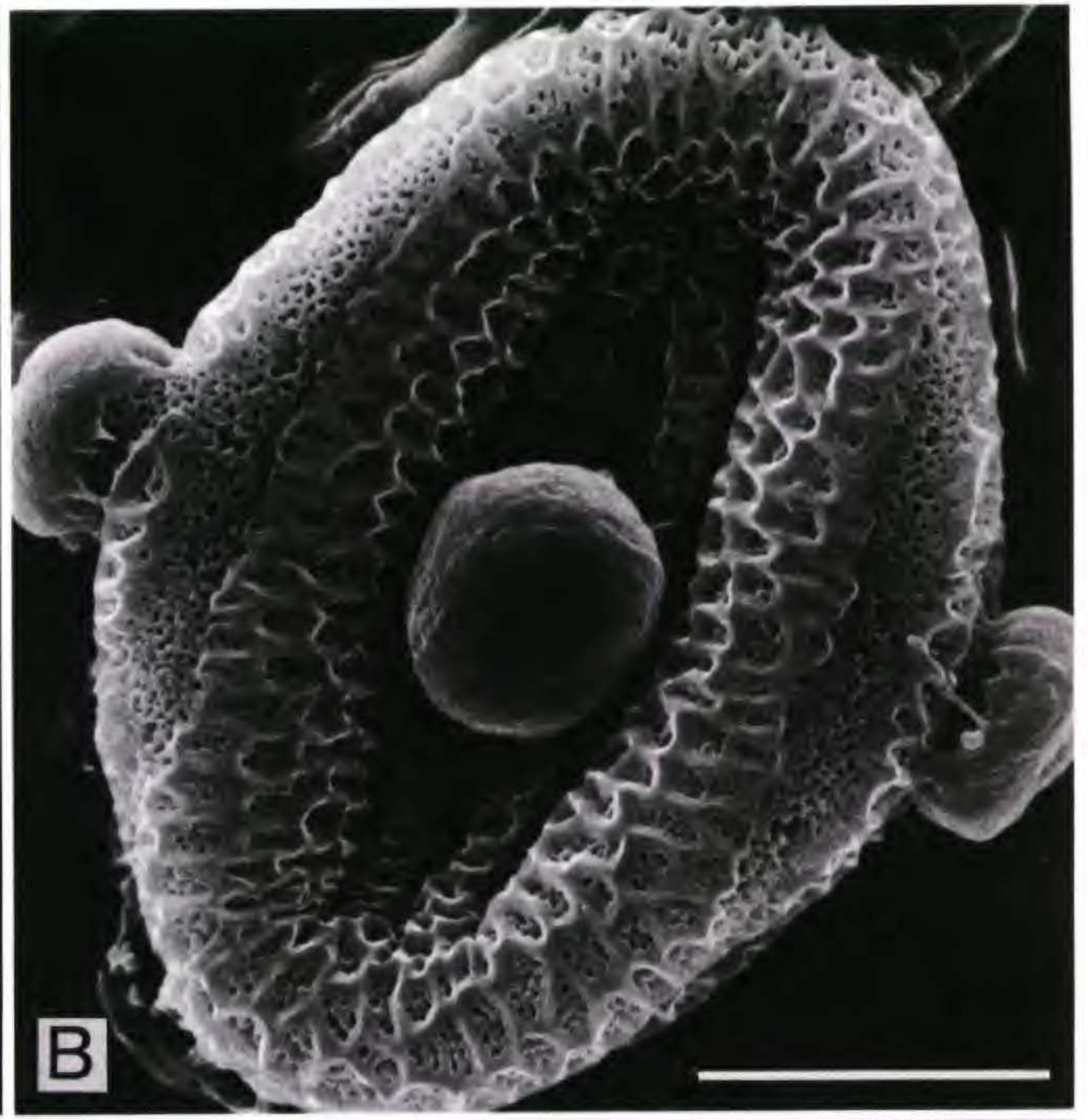
ered; rachis villose. Pedicels ca. 3 mm long. Bracts ca. 5 mm long, subulate, glabrous. Bracteoles similar to bracts. Calyx 5-merous, segments of equal length, subulate, 8 mm long, glabrous. Corolla bilabiate, ascending, arched, 3.3 cm long, red, glabrous; throat 3 mm diam.; upper lip ca. 5 mm long, straight,



Figure 6. *Razisea villosa* Gómez-Laurito & Hammel (*Herrera & Fallas 4641*).

acute; lower lip 3-lobulate, lobules ca. 1 mm long, acute. Stamens 2, exerted to 8 mm longer than the corolla; filaments flattened, glabrous; anthers 1-locular, dorsifixed, longitudinally dehiscent, locule

3.5 mm long; pollen spheroidal, ca. 57 μm diam. (Fig. 7F). Ovary glabrous; style exerted to 8 mm longer than the corolla, glabrous; stigma single, capitate. Fruits claviform, 1.8 cm long, glabrous, acute



at the tip; retinacula acute. Seeds \pm deltoid, 2.2 mm long, 1.8 mm wide, pale yellow, papillose throughout.

Habitat and distribution. Known from wet lowlands of the Atlantic slope and from the Osa Peninsula on the Pacific; in shade along streams or edge of swamp forest.

Etymology and relationships. For Costa Rica, and the genus, this is the fourth species of *Razisea*. Among the three red-flowered species, *R. villosa* is easier to distinguish, in general appearance, from *R. spicata* than is the smaller-flowered twin of that species, *R. wilburii* McDade. Besides its relatively small corollas, *R. villosa* differs in its conspicuous red, villous pubescence (from whence the epithet), and its much smaller stature. In addition, it differs from *R. wilburii* by its longer (ca. 2 \times) calyx lobes, more like those of *R. spicata*. Our understanding of the three red-flowered species of *Razisea* at one site (La Selva Biological Station) indicates that the new species is relatively rare and found in somewhat wetter (swampy) and less secondary habitats than the other two species.

Paratypes. COSTA RICA. **Heredia:** Sarapiquí, N of Puerto Viejo, 12 km to ferry, over ferry, 6 km along road, 100 m, 3 Feb. 1983 (fl), *N. Garwood et al.* 1013 (CR); La Selva, 3 km SE of Puerto Viejo, 45 m, 9 Dec. 1972 (fl), *P. Opler* 1619 (CR); Sarapiquí, Rara Avis, ca. 15 km SO de Horquetas, camino Leví, 10°17'N, 84°02'W, 400 m, 9 Oct. 1989 (fl, fr), *O. Vargas* 212 (ARIZ, CR, INB, MO); El Plástico, 600 m, 30 Oct. 1992 (fl, fr), *I. Chacón* 92-36 (USJ); Parque Nacional Braulio Carrillo, Estación El Ceibo, bosque entre la Estación y la margen

izquierda del Río Peje, 10°19'45"N, 84°04'50"W, 500 m, 8 Dec. 1989 (fl), *A. Chacón* 596 (CR, MO, USJ). **Puntarenas:** Cantón de Osa, Fila Costeña, Fila Cruses, cabeceras del Río Piedras Blancas, 8°49'02"N, 83°11'25"W, 900 m, 7 Dec. 1993 (fl), *Hammel et al.* 19193 (CR, INB).

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Figure 7. Scanning electron photomicrographs of Acanthaceae pollen. —A. *Habracanthus tilaranensis* (Haber & Bello 5996). —B. *Justicia aurantiimutata* (Castro 19). —C. *Justicia deaurata* (Hammel 17981). —D. *Justicia peninsularis* (Herrera 44431). —E. *Kalbreyeriella rioquebradasiana* (Hammel 17957). —F. *Razisea villosa* (Herrera & Fallas 4641). Scales equal 10 μ m.